

A New Triggerfish of the Genus *Abalistes* (Tetraodontiformes: Balistidae) from the Western Pacific

KEIICHI MATSUURA^{1*} AND TETSUO YOSHINO²

¹ Division of Fishes, National Science Museum,
3–23–1 Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan
matsuura@kahaku.go.jp

² Department of Marine Sciences, Faculty of Science,
University of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-0213, Japan
b985005@sci.u-ryukyu.ac.jp

ABSTRACT. A new species of triggerfish, *Abalistes filamentosus* is described on the basis of 17 specimens collected at depths from 61 to 180 m in Japan, the Northwest Shelf of Australia, and the Timor Sea. It differs from the congener, *A. stellatus* (Anonymous, 1798), by having filamentous upper and lower caudal-fin rays, 3–4 longitudinal grooves on the cheek, and by lacking yellow/pale blue spots and yellow reticulations on the body. The new species is not sexually dimorphic. The authorship of *Abalistes stellatus* is clarified.

MATSUURA, KEIICHI, & TETSUO YOSHINO, 2004. A new triggerfish of the genus *Abalistes* (Tetraodontiformes: Balistidae) from the western Pacific. *Records of the Australian Museum* 56(2): 189–194.

Triggerfishes of the genus *Abalistes* Jordan & Seale, 1906, are widely distributed in shallow waters in tropical and subtropical regions of the Indo-west Pacific and are commercially important in countries in southeast Asia (Matsuura, 2001). *Abalistes* is clearly separated from other members of the family Balistidae by the following combination of characters: enlarged osseous scales behind gill opening; a deep groove before eye; caudal peduncle depressed, wider than deep; first dorsal fin with 3 prominent spines; frontal greatly expanded posteriorly beyond level of posterior edge of posttemporal, forming round posterodorsal surface of cranium (Matsuura, 1979, 1980). The genus has long been considered to include only one species, *Abalistes stellatus* (Anonymous, 1798). While examining triggerfish specimens collected from the Ryukyu Islands, we found two forms of *Abalistes*: one having filamentous caudal-fin rays and 3–4 longitudinal grooves on the cheek but lacking prominent yellow/pale blue spots and yellow reticulations on the body, and the other lacking

filamentous caudal-fin rays and longitudinal grooves on the cheek, but having a colourful body with many yellow/pale blue spots and yellow reticulations. Careful examination of many *Abalistes* specimens led us to conclude that the former is a new species and the latter is *A. stellatus*. We herein describe the new species as *A. filamentosus*.

Materials and methods

The methods of counting and measuring primarily follow those of Matsuura (1980). The body width was measured between the pectoral-fin bases; the length of the middle caudal-fin ray was the distance between the caudal-fin base to the tip of middle caudal-fin ray; and, the postorbital length was measured from the upper end of the gill opening to the nearest point of the orbital edge. The pectoral-fin ray count excludes the uppermost rudimentary ray. Standard length and head length are abbreviated as SL and HL, respectively. In the following description, data in parentheses refer to

* author for correspondence

Table 1. Frequency distributions of fin-ray counts and scale-rows in two species of *Abalistes*.

species	dorsal-fin rays			22	anal-fin rays					pectoral-fin rays			
	25	26	27		23	24	25	26	14	15			
<i>A. filamentosus</i> n.sp.	4	10	3	1	3	9	4	0		16	1		
<i>A. stellatus</i>	0	12	11	0	0	14	8	1		22	1		
	body scale-rows												
	33	34	35	36	37	38	39	40	41	42	43	44	45
<i>A. filamentosus</i> n.sp.	1	3	5	3	1	3	1	0	0	0	0	0	0
<i>A. stellatus</i>	0	0	4	4	1	3	2	4	2	0	0	0	1
	head scale-rows												
	25	26	27	28	29	30	31	32	33				
<i>A. filamentosus</i> n.sp.	1	0	6	3	2	3	1	1	0				
<i>A. stellatus</i>	0	2	5	4	5	3	2	1	1				

the paratypes when they differ from the holotype. Institutional abbreviations follow Leviton *et al.* (1985).

Comparative material examined. *Abalistes stellatus*, 46 specimens, 57–395 mm SL. Japan, Ryukyu Islands: HUMZ 46138, NSMT-P 65598, URM-P 3304, 3326; South China Sea: HUMZ 37979, 38206, 38252, 38353, 38292, 38304, 38306, 38307, 50109, 50123; Indonesia, Ambon: BPBM 19459; Australia: BMNH unregistered 57 mm (holotype of *Balistes phalreatus*), AMS I.16218-001, AMS I.15557-266; Indian Ocean: BMNH 1865.3.18.2, HUMZ 6517–6526, (10), 6803, 6805, 89452, 89453, NSMT-P 45065 (4), RUSI 2870 (5), RUSI 38483, RUSI 48248, SAM 33694, ZRC 38091.

Abalistes filamentosus n.sp.

Fig. 1a

Abalistes stellatus.—Matsuura, 1980, p. 39 (in part); Matsuura, 1984 (in part), pl. 322–I.

Abalistes stellaris.—Matsuura, 1985, pp. 626, 627, 743.

Type material. HOLOTYPE: NSMT-P 65579, 243 mm SL, female, Ryukyu Islands, south coast of Okinawa-jima Island, off Itoman, 17 June 1982, hook and line, T. Yoshino (obtained from local fisherman). PARATYPES: AMS I.37974-001, 283 mm SL, Timor Sea, 09°57.15'S 129°31.96'E, 65 m depth, trawl, 30–31 March 1995, F.Lloyd (NT Fisheries); CSIRO H.1075-02, 216 mm SL, Western Australia, north of Monte Bello Islands, 19°56.2'–19°57.6'S 115°35.5'–115°36.8'E, 66–68 m depth, 8 October 1987, demersal trawl, FRV Soela; CSIRO H.2455-04, 245 mm SL, Western Australia, north of Dampier Archipelago, 19°10.1'–19°11.8'S 116°47.1'–116°46.5'E, 180–166 m depth, 3 October 1989, demersal trawl, W. Whitelaw (CSIRO); CSIRO H.3223-03, 227 mm SL, Western Australia, north of Barrow Island, 20°10.2'–20°08.7'S 115°15.6'–115°15.1'E, 10 October 1990, demersal trawl, FRV Southern Surveyor; HUMZ 38667, 277 mm SL, Ryukyu Islands, south coast of Okinawa-jima Island, off Itoman, 9 March 1974, hook and line, K. Matsuura (obtained from local fisherman); HUMZ 38705, 228 mm SL, Ryukyu Islands, south coast of Okinawa-jima Island, off Ohjima, 15 April 1974, hook and line, T. Shimizu (obtained from local fisherman); HUMZ 38706, 282 mm SL, Ryukyu Islands, west coast of Okinawa-jima Island, off Naha, 5 April 1974, hook and line, T. Shimizu (obtained from local fisherman); HUMZ 68923, 325 mm SL, Ryukyu Islands, south coast of Okinawa-jima Island, off Itoman, 9 March 1974, K. Matsuura (obtained from local fisherman); HUMZ 68924, 281 mm SL, data same as preceding paratype; HUMZ 68925, 267 mm SL, data same as preceding paratype; HUMZ 68926, 296 mm SL, data same as preceding paratype; NSMT-P 49363, 233 mm SL, Ryukyu Islands, Yaeyama Group, Nakano-ogan-jima Island, 24°07.2'N 123°40.1'E, 152 m depth, 14 August 1996, hook and line, K. Yano; NSMT-P 65580, 317 mm SL, Ryukyu

Islands, south coast of Okinawa-jima Island, off Itoman, 18 June 1982, long line, T. Yoshino (obtained from local fisherman); URM-P 3320, 295 mm SL, male, data same as holotype; URM-P 3321, 253 mm SL, ♀, data same as holotype; URM-P 3334, 274 mm SL, Ryukyu Islands, south coast of Okinawa-jima Island, off Itoman, 18 June 1982, long line, T. Yoshino (obtained from local fisherman).

Diagnosis. Dorsal rays III+25–27; anal rays 22–25; pectoral rays 14–15 (usually 14); body scale rows 33–39; head scale rows 25–32 (Table 1). Upper and lower rays of caudal fin greatly produced in filaments. Cheek with 3 or 4 longitudinal grooves. Proximal part of spinous dorsal fin dark brown; no yellow/pale blue spots or yellow reticulations on the body; ground colour of body dark brown dorsally, mottled with irregular pale markings, becoming white ventrally; cheek brown with greenish tinge.

Description. Body depth 2.7 (2.6–3.2) in SL, head length 2.9 (2.8–3.0) in SL, snout length 4.1 (3.9–4.3) in SL, snout to origin of first dorsal spine 2.6 (2.5–2.7) in SL, snout to origin of anal fin 1.5 (1.5–1.6) in SL, base of soft dorsal fin 3.3 (3.0–3.3) in SL, base of anal fin 3.5 (3.4–3.8) in SL. Body width 1.7 (1.7–2.2) in HL, eye diameter 4.3 (3.5–5.3) in HL, interorbital width 3.3 (2.9–3.5) in HL, length of gill opening 3.4 (3.2–4.2) in HL, postorbital length 5.3 (4.5–5.1) in HL, depth of caudal peduncle 8.5 (7.4–10.8) in HL, length of caudal peduncle 2.4 (2.0–2.7) in HL, length of first dorsal-fin spine 1.7 (1.5–2.0) in HL, length of longest soft dorsal-fin ray 2.9 (2.5–3.4) in HL, length of longest anal-fin ray 2.8 (2.8–4.3) in HL, length of middle caudal-fin ray 2.3 (2.2–2.6) in HL, length of pectoral fin 3.0 (2.8–3.5) in HL.

Body relatively elongate, compressed, covered with rhomboidal, plate-like scales as in other balistids; several longitudinal rows of small tubercles on posterior part of body extending forward from caudal-fin base to below posterior part of soft dorsal fin. Dorsal and ventral profiles of head convex. Scales on cheek forming several longitudinal rows, having 3–4 longitudinal grooves between scale rows. Mouth small, terminal, with thin fleshy lips; teeth incisiform, notched on edges; each upper jaw with 4 teeth in outer series and 3 teeth in inner series; each lower jaw with 4 teeth in a single series. Gill opening small, slit-like, slightly oblique, located behind and below eye; a patch of enlarged osseous scales just behind upper end of gill opening. Origin of spinous dorsal fin above pectoral-fin base; first dorsal spine very long and stout, covered

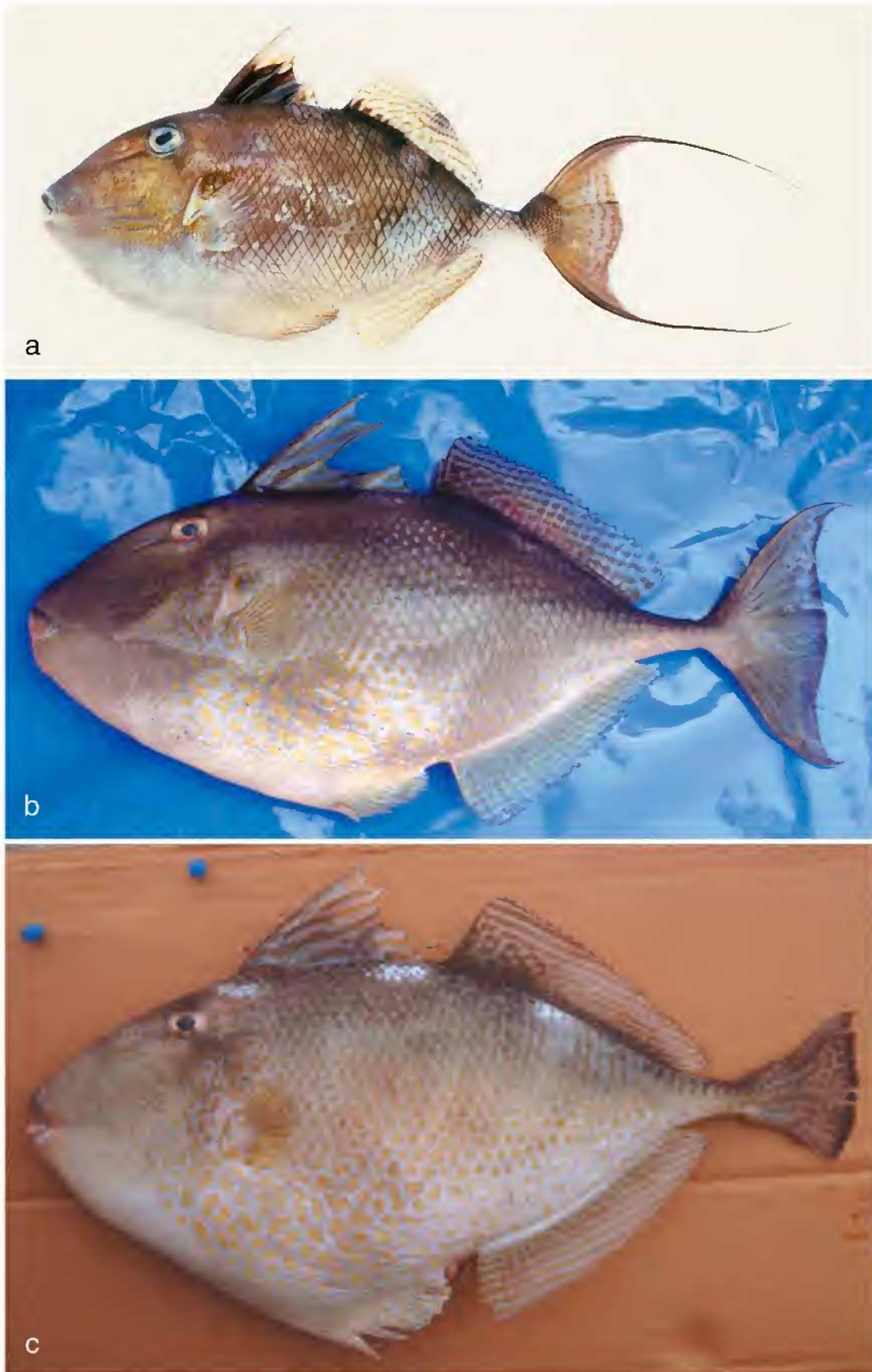


Fig. 1. *Abalistes filamentosus* n.sp. and *A. stellatus*. (a) *Abalistes filamentosus* n.sp., NSMT-P 65579, holotype, 243 mm SL, Ryukyu Islands, Japan; (b) *A. stellatus* NSMT-P 65598, 354 mm SL, Ryukyu Islands, Japan; (c) *A. stellatus* URM-P 3304, 395 mm, Ryukyu Islands, Japan.

Table 2. Measurements of type specimens of *Abalistes filamentosus* expressed as percentages of standard length with comparisons to *A. stellatus*.

collection registration number	<i>Abalistes filamentosus</i>									
	holotype NSMT-P 65579	AMS I. 37974-001	paratypes (continued on facing page)						NSMT-P 65580	HUMZ 38667
	CSIRO H1075-02	CSIRO H2455-04	CSIRO H3223-03	NSMT-P 49363	NSMT-P 65580	HUMZ 38667	HUMZ 38705			
standard length (mm)	243	283	216	245	227	231	317	277	228	
body depth	37.4	34.6	37.0	35.5	37.4	38.5	30.9	34.3	36.8	
body width	21.0	17.7	17.6	18.0	18.5	18.2	16.4	16.2	18.9	
head length	35.0	35.0	33.3	33.1	33.5	35.1	34.1	34.3	35.5	
snout length	24.7	25.8	24.5	25.3	24.2	25.1	25.2	23.5	25.4	
snout to origin of first-dorsal spine	38.3	38.9	39.4	40.4	38.8	39.0	37.5	36.8	39.0	
snout to origin of anal fin	66.7	63.6	63.0	64.1	65.6	63.6	63.4	65.7	64.5	
interdorsal space	21.4	19.1	23.6	21.2	23.3	21.6	22.4	22.7	23.2	
postorbital length	6.6	7.8	6.9	6.9	6.6	7.4	6.9	7.2	7.5	
eye diameter	8.2	7.4	7.4	9.4	8.8	8.2	6.9	7.9	7.5	
interorbital width	10.7	10.6	11.1	10.2	11.0	11.7	9.8	11.2	11.4	
length of gill opening	10.3	8.8	8.8	9.4	7.9	10.0	9.8	10.5	9.6	
length of first-dorsal spine	21.0	19.4	—	20.4	—	22.9	16.7	19.5	21.1	
length of longest dorsal-fin ray	11.9	11.0	11.6	10.6	10.6	10.4	11.0	11.2	14.0	
length of longest anal-fin ray	12.3	8.5	10.2	9.8	8.8	8.2	10.4	10.1	12.3	
length of pectoral fin	11.5	10.2	10.6	11.4	11.0	10.8	11.4	10.1	11.8	
length of mid-caudal-fin ray	15.2	14.5	14.4	14.7	13.7	16.0	13.9	13.4	15.4	
depth of caudal peduncle	4.1	3.9	4.2	4.1	4.0	4.3	3.2	4.0	3.9	
length of caudal peduncle	14.4	13.1	16.2	14.3	14.1	14.3	13.9	15.2	14.5	
length of soft dorsal-fin base	30.5	31.8	30.6	32.7	30.8	32.0	31.5	31.4	31.6	
length of anal-fin base	28.4	29.0	27.8	28.2	28.6	28.6	28.4	27.4	28.5	

anteriorly with tubercles; second dorsal spine about three-fourths of first spine; third dorsal spine shorter and more slender than second spine, but prominently projecting above dorsal contour. Soft dorsal and anal fins similar to each other in shape, gently rounded. Pelvic dewlap not developed; encasing scales movable dorsoventrally, attached to posterior end of pelvis. Caudal fin double emarginated, upper and lower rays greatly produced posteriorly into filaments, usually much longer than head length. Caudal peduncle depressed, wider than deep.

Live coloration. Dorsal half of body dark brown mottled with irregular pale markings; 3 white blotches on back, first below base of first dorsal-fin spine, second immediately behind third dorsal-fin spine, and third below middle of soft dorsal fin; cheek greenish brown with 3–4 longitudinal dark brown grooves; ventral half of body pale or white; dorsal half of snout brown; first dorsal fin with large dark brown area on proximal part, pale distally with brown lines; soft dorsal and anal fins pale with 4–5 horizontal wavy brown lines; base of soft dorsal fin dark brown but base of anal fin white; base of caudal fin dark brown dorsally, white ventrally; caudal fin brown or yellowish brown proximally, paler distally with 3–4 vertical wavy brown lines; upper and lower filamentous rays dark brown.

Sexual dimorphism. The holotype and two paratypes (URM-P 3320 and 3321) were dissected to examine gonads; the holotype and URM-P 3321 are females and URM-P 3320 is male. These specimens do not show sexual dimorphism in shape and colour.

Etymology. The new species is named *filamentosus* after the filamentous rays in its caudal fin.

Distribution. *Abalistes filamentosus* is known from the Ryukyu Islands in Japan, the North West Shelf of Australia, and the Timor Sea. The capture records of the type specimens range from 61 to 180 m.

Remarks. The type specimens of *A. filamentosus* were compared with 46 specimens of *A. stellatus*. As shown in the Diagnosis, *A. filamentosus* differs from *A. stellatus* (Fig. 1b,c) in having filamentous caudal-fin rays, 3–4 longitudinal grooves on the cheek, and the body without colourful markings. The soft rays of the dorsal and anal fins of *A. filamentosus* have relatively lower counts with wider ranges than those of *A. stellatus* (Table 1). No clear differences are found between two species in proportional measurements (Table 2).

Richardson (1845) described *Balistes vachellii* on the basis of a specimen (3.75 inches = 9.5 cm in length) collected from Canton, China, by Rev. George Vachell. Although the type specimen was apparently lost, Richardson stated “No naked spaces exist on the cheek” and “The end of the caudal is even, but the second ray above and below forms a little projecting point”. These characters show that *Balistes vachellii* is a junior synonym of *Abalistes stellatus* (Anonymous, 1798). Richardson (1846) described *Balistes phalreatus* from a single specimen (2.25 inches = 5.7 cm SL) collected from the western coasts of Australia (no detailed locality given). His description and the plate (plate 1, figs. 4–5) show that *Balistes phalreatus* is *Abalistes stellatus*. Examination of the type specimen confirms that it does not have any grooves on the cheek.

There are complicated nomenclatural problems with the name *Abalistes stellatus*. Two similar specific names, *stellaris* and *stellatus*, have been used for this triggerfish by many authors. The specific name, *stellaris*, was first given to the species by Bloch & Schneider (1801) based on Lacepède's

Table 2. (Continued from facing page). Measurements of type specimens of *Abalistes filamentosus* expressed as percentages of standard length with comparisons to *A. stellatus*.

<i>Abalistes filamentosus</i>								<i>Abalistes stellatus</i>			
paratypes (continued from facing page)											
HUMZ	HUMZ	HUMZ	HUMZ	HUMZ	URM-P	URM-P	URM-P	range	(mean)	range	(mean)
38706	68923	68924	68925	68926	3320	3321	3334				
282	325	281	267	296	295	253	274	216–325	(267)	110–395	(244)
34.4	31.4	32.0	32.6	35.5	34.2	35.2	35.4	30.9–38.5	(34.9)	27.8–37.9	(34.3)
15.2	18.2	16.4	17.2	16.6	18.6	19.8	20.4	15.2–21.0	(17.9)	12.8–19.9	(17.2)
33.3	33.8	33.8	34.5	34.1	34.2	34.0	34.3	33.1–35.5	(34.2)	27.8–37.1	(32.9)
24.5	24.3	24.9	25.5	25.0	25.1	24.5	24.5	23.5–25.8	(24.8)	19.7–25.2	(22.9)
36.9	36.9	36.7	38.2	38.2	36.9	37.9	38.0	36.7–40.4	(38.1)	29.4–36.2	(40.9)
61.7	63.1	63.0	62.9	62.5	61.0	65.2	63.9	61.0–66.7	(63.7)	50.0–68.0	(61.3)
22.3	23.1	22.4	22.5	23.0	21.0	22.9	21.2	19.1–23.6	(22.2)	19.8–25.6	(22.9)
7.1	7.1	6.8	7.5	7.1	7.5	7.1	7.3	6.6–7.8	(7.1)	6.1–8.5	(7.2)
6.7	7.4	6.8	7.1	7.8	6.4	8.3	7.3	6.4–9.4	(7.6)	5.1–11.4	(7.8)
9.9	9.8	11.0	10.1	10.8	10.2	11.9	10.9	9.8–11.9	(10.7)	8.0–13.3	(10.7)
9.2	10.2	10.0	10.1	10.5	8.8	10.7	9.9	7.9–10.7	(9.7)	6.1–11.2	(9.2)
19.1	19.1	19.9	21.3	19.9	21.0	18.2	19.7	16.7–22.9	(17.6)	13.9–25.6	(20.5)
10.3	10.8	10.3	10.9	10.8	12.2	12.6	13.1	13.0–14.0	(11.4)	8.5–14.4	(12.0)
8.9	9.5	8.9	9.7	9.5	11.2	11.5	10.9	8.2–12.3	(10.0)	7.0–13.7	(11.1)
10.6	11.4	9.6	10.5	10.5	11.9	11.9	12.0	9.6–12.0	(11.0)	7.8–12.3	(10.4)
13.5	12.9	13.5	14.2	14.5	14.6	15.4	14.6	12.9–16.0	(14.4)	11.9–18.2	(14.5)
3.9	4.0	3.9	3.7	4.1	4.1	4.0	4.0	3.2–4.3	(4.0)	3.2–5.1	(4.0)
16.3	16.6	15.7	14.2	14.2	15.3	16.2	15.7	13.1–16.6	(14.9)	11.2–17.1	(14.7)
30.9	31.7	31.0	31.8	30.7	32.9	30.0	32.1	30.3–32.9	(31.4)	24.5–33.2	(30.6)
28.4	28.9	28.8	28.5	28.0	29.2	26.1	27.4	26.1–29.2	(28.2)	23.6–31.6	(28.6)

(1798) publication. The name *stellaris* has been applied to this triggerfish by authors such as Herre (1924), Fowler (1928), McCulloch (1929), Smith (1949), Munro (1955), Kyushin *et al.* (1977), Dor (1984), Matsuura (1984, 1985, 2001), Winterbottom *et al.* (1989), and Hayashi (2002). The name *stellatus* has also been applied to this species by authors such as Rüppell (1828), Bleeker (1865–1869), Günther (1870, 1910), Day (1875), Macleay (1881), Barnard (1927), Whitley (1941), de Beaufort & Briggs (1962), Matsuura (1980), Smith & Heemstra (1986), Allen & Swainston (1988), Randall *et al.* (1990), Kuitert (1993, 1997), Randall (1995), Myers (1999), and Iwatsuki *et al.* (2000). Whitley (1941), de Beaufort & Briggs (1962) and Matsuura (1980) showed that Anonymous (1798) first used the Latinized specific name, *stellatus*, for this species, although the description by Anonymous was based on Lacepède's (1798) publication. Other authors attribute the authorship to Lacepède (1798). Allen & Swainston (1988) provided an excellent illustration and short account of this species but added to the confusion by applying the authorship of Bloch & Schneider to *stellatus*. Matsuura (2001) stated that *Abalistes stellatus* (Lacepède, 1798) is invalid because Lacepède did not describe the species using a scientific name but only the French vernacular name.

As shown by Matsuura (2001), this taxon was described by Lacepède (1798: 333, 350, pl. 1, fig. 1) under the French vernacular name, Baliste étoilé. Lacepède's publication was briefly reviewed in the same year by Anonymous in an article in the *Allgemeine Literatur-Zeitung* (general literature newspaper). Anonymous gave brief descriptions of triggerfishes and filefishes on pages 681 and 682.

Hannelore Paxton kindly provided comments about problems in the article: Anonymous sometimes confused pectoral and pelvic fins, and in most places he did not distinguish between the first (spinous) and second dorsal

fins, but he sometimes did. Her translation is given below with our interpretation in square brackets.

...(6) *Balistes*. This genus has been brought under four subdivisions. a) *Balistes* with more than one ray in the pectoral [lapsus for pelvic] and dorsal fins.—*Vetula*; this species has remarkably beautiful colours. ...—*Stellatus (etoile)* [with no accent] from Commerson's papers/manuscripts, is a new species, which he has caught around the Isle de France [Mauritius]. Small spots are distributed over the whole body, 8 or 10 rays [lapsus for spiny elements along the edge of the ventral flap] are in the pelvic fin, without spines on the side of the tail.—*Echarpe* [with no accent], taken from the same paper/manuscript, characterized particularly by its broad black stripe, running obliquely from the eye to the anal fin, giving it the species name, with 8 to 10 stripes [lapsus for spiny elements along the edge of the pelvic dewlap] in the pelvic fin, 4 rows of spines on the side of the tail; from the seas around the Isle de France. This subdivision includes *biaculeatus* [neither capitalized nor italicised] L. b) *Balistes* with more than one ray in the pectoral fin [lapsus for pelvic] and in the dorsal fin [lapsus, not including "first"]. Here we find only the species *sinensis* [neither capitalized nor italicised] L. c) *Balistes* with 1 single ray in the pectoral fin [lapsus for pelvic] and more than 1 in the dorsal fin [lapsus not including "first"]. —*tomentosus*, —*papillosus*, etc. d) *Balistes* with a single ray in the first pectoral and dorsal fins [lapsus, as first presumably should only go with dorsal]. Here are the species *monoceros* and *hispidus* of Linne.

It is clear that Anonymous intended to state that *Balistes* has four subdivisions including *Vetula*, *Stellatus (etoile)* and *Echarpe*, and this shows that the idea of binominal nomenclature was used by Anonymous. Thus, we conclude that *Balistes stellatus* was proposed and available by Anonymous.

ACKNOWLEDGMENTS. Specimens and collection data were kindly provided by M. McGrouther and S. Reader (AMS), A. Gill (BMNH), J.E. Randall and A. Suzumoto (BPBM), A. Graham and P. Last (CSIRO), H. Imamura (HUMZ), R. Williams (NTM), M. Toda (Okinawa EXPO Park Aquarium), E. Anderson and P. Heemstra (RUSI), P. Hulley (SAM), and P. Ng (ZCR). The German article by Anonymous was kindly translated by H. Paxton. We are grateful to J. Paxton and J. Leis for giving the first author warm hospitality during his stay at AMS. This study was partly supported by a grant to the first author by the Ministry of Education, Culture, Sports and Technology, Japan (no. 13575014).

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Manuscript received 29 January 2003, revised 29 May 2003 and accepted 29 May 2003.

Associate Editor: J.M. Leis.